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## ABSTRACT

Seven schools in which pupil achievement was high were matched with seven schools in which pupil achievement was low. Nine teachers were selected for observation in each school; teachers filled out questionnaires, and principals were interviewed. Significant differences in favor of schools with high pupil achievement were found in teacher expectations for pupils, in teacher attitudes toward pupils, in the use of positive reinforcement, in the cognitive load of materials presented, and in a number of related variables. Principals in schools with high pupil achievement generally saw their teachers as more competent. Implications of these findings for further work on variables of teacher behavior are discussed. (Author)

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A STUDY OF TEACHER BEHAVIOR AND ATTITUDES  
IN ELEMENTARY SCHOOLS WITH HIGH AND LOW  
PUPIL ACHIEVEMENT

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## Introduction

This study represents the third phase of a research effort which began in 1970. David Irvine and John Heim (1973), Bureau of School Programs Evaluation, New York State Education Department, noted a wide range of test scores among several New York City schools even though all of the schools drew from low socio-economic populations. High and low scoring schools from the Irvine and Heim study were identified and labeled as "outliers."

As a next step, Alan Robertson, Director of the Division of Education Evaluation, found that staff members of the New York Central Board of Education, who recognized the schools were in every case able to identify the school as high or low. Because the high and low schools did appear to be viewed differently by people who know them, an effort was made to determine the extent to which school environment, school program, and administrative conditions might be related to the different test scores.

Next an effort was made to determine whether schools judged to be high or low performers in the Irvine-Heim study were consistently high or low, or whether this was an accidental finding which just happened to occur in one school year. A statistical analysis to determine consistency of school building reading scores was performed. Identified were a group of five schools whose reading scores were consistently high and five schools in which scores were consistently low. In addition, a school was found in which test scores increased over a two year period, and a school was found in which scores declined over the same two year period.

The twelve schools identified were then used as the targets for structured observations. "Blind" evaluators classified eight out of ten of the high and low schools correctly. In seven out of ten cases, all evaluators judged correctly. (Generally, three evaluators visited each school.) While specific differences between high and low scores were not completely consistent, seven factors emerged as likely to be more true of high achieving schools than of low achieving schools.

Briefly, these characteristics are:

1. Teachers manifested better rapport with students.
2. Teachers exercised more effective control of pupils.
3. Teachers engaged in more extensive preparation of lessons.
4. Reading instruction was at a more appropriate level for the needs of pupils.
5. Teachers provided for more extensive regrouping within the reading period.
6. Teachers provided for more extensive use of material in the reading program.
7. The sources of leadership in instruction in reading were more forceful and positive.

Because certain behaviors did indeed seem to distinguish high and low achieving schools, it was suggested that, "With the elimination or control of some of the design problems enumerated earlier, and with more extended observations in the schools, it would be extremely valuable to see whether these same behavioral variables emerge in distinguishing high and low achieving schools."

As a follow-up to this recommendation a group of faculty and students at the State University of New York at Albany were asked to revise the instruments used in New York City, to design new instruments that might be used to measure variations in teaching, and to employ these instruments in selected schools. Fourteen schools were to be selected by the State Education Department. Seven of the selected

schools showed consistently high performance and seven relatively low performance.

#### Overview of the Instrument Development Process

As a first step, the original forms used in the Outlyer Study were examined and discussed by the group. From the original Outlyer forms, a list was made of items for further consideration. This list was discussed by the group in terms of the importance of each item and the psychometric problems connected with each item. In addition, consideration was given to ways and means in which relevant information might be gathered in the school. Specific scales and general scale definitions were then developed.

Arrangements were made for field tryouts in two public schools. In each case, four observers visited the school. Pairs of observers made twenty-minute observations in six different classrooms so that each observer was paired with every other observer. Also a pair of observers interviewed the reading teacher and the other two observers interviewed the school principal.

After the first field trials had been made, data were inspected for reliability, and a group meeting was held to discuss problems and procedures. In this meeting agreement was reached that some forms needed revision, some categories needed redefinition, and some new areas needed to be included. Again, individuals took responsibility for revision. Revisions were made, further editing was done, and forms were prepared for use in fourteen schools to be selected by the State Education Department.

Seven of the instruments developed are discussed in this paper. Four of these instruments were designed to be used in each of the classrooms visited. Also developed were a principal interview schedule and a reading teacher interview schedule, and a questionnaire to be filled out by the teachers observed.

#### Procedures for School Visits

After instruments had been revised and constructs redefined, fourteen school buildings in upstate New York were selected. Seven buildings were nominated because PEP reading scores were relatively high and seven buildings because scores were relatively low. Individuals doing the observations were unaware of whether the school which they visited was "high" or "low."

For each school visit the principal was asked to arrange access to nine elementary school classrooms between kindergarten and sixth grade. (In a few of the smaller schools, nine classrooms were not available.) Each observer was assigned to four of these classrooms, and the pair of observers were together in one classroom during the day. In addition, an interview was held with the school principal and with a reading teacher in the school.

#### Analysis of Data - Overview

In this report a brief description is provided of each of the seven instruments that were developed, and means are provided for classes in the high and low schools. In some cases separate analyses are provided for grades 1-3 and grades 4-6. T-tests of significance of the differences between the means were computed except for principal

interview and reading teacher interviews when the N for each group was only seven.

#### General Classroom Observation Form

The General Classroom Observation Form consists of 16 items. Questions are grouped under the areas of program emphasis, teacher behavior, pupil behavior, and facilities. A five-point Likert scale was used. Operational definitions were developed for each end of the scale.

Data from the General Classroom Observation Form reported in Table 1 show clear differences between classes in high and low schools in grades 1-3 but relatively little difference between classes in grades 4-6.

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Table 1 about here  
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For early elementary grades, items which did not differentiate the groups were program emphasis on social development, rigidity of student behavior, and the three items on facilities. Classes in high reading schools were significantly higher on all items except "effort to maintain control," and "rigidity of student behavior." For these ratings, high reading classes in grades 1-3 were significantly lower. Thus, in grades 1-3 classes in high reading schools, teachers don't work as hard to maintain control and have less rigid student behavior, but at the same time are rated significantly higher in effectiveness of control. Also teachers in high reading schools are rated as warmer, more supportive, more responsive to students, and showing more emphasis on cognitive development. Pupils in their classes appear more enthusiastic about school and better able to sustain attention.

In grades 4-6, however, only the differences in teacher efforts to maintain control and effectiveness of control were significant. The pattern was the same as in the lower grades, with teachers in high reading schools making less effort to maintain control but being rated more effective in control.

#### Observation of a Reading Group

The form used for observation of reading classes is a modification of an observation system developed and tested by Educational Testing Service, Quirk, et. al. 1973, Weinberg, et. al. 1974. To develop the original instrument, members of a research team visited second, fourth, and sixth grade reading classes and kept a log of the activities that took place. Eventually, they arrived at twelve categories to describe what they called the Content of Instruction. They also developed definitions and examples of each area. The procedure used by ETS called for a different student to be scored on the instrument during each fifteen second interval in an observation period of fifteen minutes.

Because in this project a broader range of observational data were desired, it was decided to attempt to score each category of Content of Instruction on a Likert scale arranged from "Little" to "Much." The categories "Extraneous" and "Negative Feedback" were dropped from the scale since other observation devices covered these areas. Separate ratings were to be made of the activities of children in a reading group directed by the teacher and children not in the reading group.

Thus, the form used in the first field tryouts consisted of ten categories to be rated for the reading group and the children not in the reading group. From these tryouts it was determined that one

additional area, oral reading, was needed for the reading group. A definition was written for this area. Also, observers found that the categories available did not allow adequate description of the behavior of children not in reading groups, and that too much inference was required to determine whether a child writing at his seat was working on word recognition, language structure, or spelling. Therefore, the list of items to be rated for the non-reading group was revised and new definitions written.

The Observation of Reading form was designed to be used only when the teacher was engaged in direct reading instruction. When arrangements for school visits were made it was stressed that some reading classes would be observed, but classes would also be visited during other activities. Since observers were in classes most of the school day, and reading was normally scheduled in the morning, reading classes were often not available. In Table 2 are presented the mean ratings for activities carried on in reading classes in high and low schools.

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Table 2 about here  
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As can be seen, relatively few reading classes were observed in grades four to six.

In grades one to three more total activity seemed to occur in the high schools. In nine of the eleven activities rated, more emphasis was given in high schools than in low schools. The two areas in which higher means were recorded for low schools were for reading orally and for management instructions. The greatest difference between high and low schools was in the relatively large amount of silent reading going

on in high schools. Thus, in classes in high schools children were more likely to read silently, and in low schools to read out loud. Although the number of classrooms is very small, this relationship between silent and oral reading extends to grades four to six.

Also examined in the Observation of Reading form were the behaviors of children who were not in reading groups. These data are also reported in Table 2.

#### Teacher Reinforcement Scale

The Teacher Reinforcement Scale used in this set of observations was developed for use in this study. From the review of literature it seemed clear that teacher reinforcement might well be a critical variable in how children learn, but the problem remained of how to score this domain in simple but meaningful way. It was agreed that one might discriminate between positive reinforcement in the form of praises or token reward, and punishment in the form of scolding, criticizing, withholding privileges, and the like. These punishing behaviors are labeled as "negative reinforcement" on the form, although they do not fit the classical learning definitions of negative reinforcement.

Along with the distinction of positive and negative, it was agreed that a distinction needed to be made between frequency and potency. Some teachers used a great number of remarks such as "good" or "correct," but they used these remarks so routinely that observers wondered if they would really have much effect. Other teachers did not praise as frequently, but they extended and elaborated their comments. Obviously, an observer can't be sure of the effect of either form of comment on a child, but the rating of potency is included as a

subjective measure in which the observer attempts to score the meaningfulness of the reinforcement given.

Finally, it was agreed that what the teacher reinforced was of interest. In some cases teachers praise or punish the child's actual product -- his math paper, or the way he reads. At other times teachers praise or punish the child's general conduct or social behavior -- the way he pays attention or works on an assignment. Therefore, it was decided to attempt to separate ratings for instructional specific and general support/social behavior reinforcement.

Data are reported in Table 3. As can be seen, teachers in grades

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Table 3 about here  
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one to three in high schools provided more positive reinforcement under all conditions, and teachers in low schools provided more negative reinforcement. However, in grades 4-6 teachers in low schools provided more reinforcement, both positive and negative, than did teachers in high schools.

In the instructional specific category teachers in all groups were recorded on the average providing more positive reinforcement than negative reinforcement. Under the category of general support, however, teachers in high schools had a higher frequency of positive than negative reinforcement, while teachers in low schools showed the reverse pattern. As the observers scored these categories, only two mean ratings reached the midpoint of the five-point scale. In general, the observers did not record high amounts of reinforcement.

### Characteristics of Open Education

Items from the Characteristics of Open Education form were derived from the Walberg-Thomas (1970) instrument. In their procedure, teacher interview was used as a means of supplementing classroom observation, while in this study only observation was used to derive data. Since this form was not used in preliminary field work, no data were available to form a basis for revision. Observers reported that some items were not really suitable for observation and also indicated that clearer polar definitions would be useful.

However, in spite of these problems, a definite trend is seen in higher mean scores of classes in high schools. (Higher scores meaning more open.) Of the 18 comparisons of classes in grades 1-3, 15 are in

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Table 4 about here  
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favor of high classes, as can be seen in Table 4. This trend was not strong in classes of grades 4-6 in which means for classes in high schools were greater in 11 of eighteen comparisons. For almost all items of open education characteristics, ratings were below the midpoint of the five-point scale. Thus, one might assume that the general sample of schools employed in this study were relatively traditional, and this assumption is verified by the opinions of the observers.

### Teacher Questionnaire

In the first planning meeting the Project team discussed the question of how to obtain information from teachers that could not be gained through observation. Clearly, it would be desirable to know about teacher intentions, philosophy, evaluations of children,

relationships with administration, and a host of other variables. At the same time, to build in even a modest teacher interview would create great scheduling problems and would drastically reduce the number of teachers who could be observed during a school visit.

The decision was finally reached to prepare a questionnaire which could be responded to very quickly. The areas of concern in this questionnaire were derived primarily from variables that appeared promising in the Outlier Study. Thus, the teacher is asked about her expectancies for the children she teaches, her assessment of the general ability and attitude of her present class, the degree to which she would expect help for various problems that might be encountered, and her assessment of the locus of control for decision-making.

Teacher questionnaires were left in each of the schools visited, and a request was made to return the questionnaires, when completed, to the Project Director. While some questionnaires were not returned, a sample of 48 responses from high schools and 51 responses from low schools were available for analysis. The first four items of the questionnaire concerned teacher expectations about children in their class projected into the future. Teachers answered these questions in terms of percentages. These data are reported in Table 5. As can be seen,

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Table 5 about here  
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teachers in high schools had higher expectations for children in all four of the areas questioned. It is interesting to note in each group that teachers expect more children to graduate from high school than they expect to become fluent readers.

A similar pattern is seen when teachers were asked about perceptions of their children in the here and now. Teachers in high schools see children in their classes as more intelligent, better behaved, more pleasant to teach, and having more concerned parents.

Also derived from the teacher questionnaire were teacher expectations for various kinds of support within the school. These data are also provided in Table 5. As can be seen, responses of teachers in high and low schools are very close. In terms of these data, at least, difference in administrative support as perceived by teachers is not a critical factor.

#### Principal Interview

The Principal Interview form was developed in large part from variables that seemed to be of interest from the original Outlyer Study. (Irvine and Heim, 1973) An effort was made to obtain (1) specific demographic information about the school; (2) subjective impressions of the principal concerning the professional staff in the school, the adequacy of facilities and material support for the reading program, the locus of control of the reading program; and (3) principal's judgement of special problems and special assets of the school.

Although the form calls for precise answers to most of the questions, the procedure specifies an informal interview approach. Thus, the person obtaining data was encouraged to engage the principal in discussion of the areas to be covered and to probe in specific areas until a scorable answer was obtained. The order of questions might be modified to fit the circumstances.

Data are reported in Table 6. As can be seen, principals in high schools provide consistently higher ratings than do principals in low schools. All average ratings fall above the midpoint of the Likert scale, indicating that, on the average, all principals gave a favorable rating.

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Table 6 about here  
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Principals were also asked a set of items about their own rapport with various groups with whom they deal. These data are also summarized in Table 6. Principals in low schools were rated from the interview as higher in rapport with the board, but lower in rapport with teachers, parents, and children. Especially noticeable is the difference of the two groups in ratings for rapport with children. However, because the number of principals in each group is only seven, conclusions must be tentative.

#### Reading Teacher Interview

The interview guide used with the reading teacher in each school was adopted from an "Observer Guide-Reading" which was made available to the Project Director by Mrs. Jane Algozzine, Chief of the Bureau of Reading, State Education Department. Originally, this observation instrument was used in direct classroom observation, supplemented by teacher interview, to describe the degree to which reading practices seen as ideal were actually practiced. The original instrument consisted of 13 categories, each to be evaluated from "low" to "high" on a five-point scale. Paragraphs describing "low" and "high" practices were provided for each item. Also, in the original instrument, considerable space was provided for comments on each room.

In this study it was decided to use ten of the thirteen "Observer Guide-Reading" categories in an interview format with the reading teacher. The definitions of "low" and "high" behavior for these ten categories were used as a guide for interviewer scoring. Aspects of the reading program which were questioned related primarily to reading as it is carried on in the classroom. Therefore, the reading person who seldom visits the classroom or talks with the teacher could not be expected to give valid responses to the questions asked. However, all reading teachers did indicate a general familiarity of the reading program as carried on in the classroom and did seem to feel that they had a good idea of the answers to these questions about the reading program.

Data are reported in Table 7. It should be noted that the averages in the table are compiled on the responses of the seven reading teachers

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 Table 7 about here  
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in the high schools and the seven in the low schools. Although the sample size is small, a definite trend can still be seen, since higher means are recorded for the high schools in nine of the ten contrasts. Only on item six, which concerns the degree to which reading material matches the ethnic background of the child, were low schools given a higher mean.

Also of interest are the absolute scores assigned from the five-point Likert scale. In general, absolute scores are higher than the scores assigned through direct classroom observation. It is not surprising that reading teachers should generally see the program in their school in a favorable light. Nevertheless, especially in the low school, most ratings fall between three and 3.5, suggesting that reading

teachers see room for improvement. (Improvement, assuming behaviors on the high end of the scale are judged superior to behaviors on the low end.)

### Summary and Conclusions

At the end of the study each observer was asked to submit in writing his impressions of each of the devices, problems they faced and the like. There was general agreement that some items on the Characteristics of Open Education form needed to be dropped, since they cannot be observed. Also, some observers questioned whether the reading teacher really knew enough about what was actually happening in classrooms to be a valid source of data. Generally it was agreed that evaluation of teacher reinforcement was important but very difficult. Especially at the end of the year it was felt that much reinforcement might be very subtle and hard to observe.

A limitation of this study, noted by several observers, was the fact that the work was carried out very near the end of the school year. Of great interest is the question of whether similar differences would be noted at the beginning of the year. Perhaps, in the area of management instruction for example, some teachers give much direction very early in the year, establish a firm routine, and need to give relatively few such directions thereafter. Observers in this study reported more management instruction in low than in high schools, but it would be interesting to note whether this difference is the same at the beginning of the school year.

Thus, next steps that might be taken in this area are:

- (1) Select the variables that seem to be related to the clearest differences between schools.

- (2) Attempt to clarify further the behaviors that are being rated and the criteria for rating each of these variables.
- (3) Consider whether the variables identified by these procedures could be meaningfully divided into sub-parts to be more specifically studied.
- (4) Try out revised materials on a broader geographic basis and with schools that are demographically more diverse.
- (5) Experiment with these materials in an in-service and/or pre-service context.
- (6) Work systematically with a group of teachers to see if teachers can learn to vary selected behaviors, and study the effects of such variations.

#### Summary of Most Significant Findings

1. Teachers in high schools made less overt effort to maintain class control, had less rigid student behavior but were more effective in maintaining the level of control they appeared to want.
2. Teachers in high schools were rated as warmer, more responsive, and showing more emphasis on cognitive development in classes that did not involve direct reading instruction as well as in reading classes.
3. Teachers in high schools expected more children to graduate from high school, to go to college, to become good readers and to become good citizens.
4. Teachers in high schools see their children as more intelligent, better behaved, more pleasant to teach, and their parents as more concerned.

5. Teachers in high and low schools do not see different amounts of help available in handling problems.
6. More total activity takes place in reading classes in high schools than in low schools.
7. Children in reading classes in high schools engage in more silent reading while children in low schools engage in more oral reading.
8. Reading teachers in evaluating the classroom reading program were on the average more favorable in high schools. Reading teachers rated teachers in high schools more favorably in using appropriate material, extending reading into other areas, asking children to read with a purpose, and using informal diagnosis.
9. In grades one to three teachers in high schools gave more positive and less negative reinforcement than did teachers in low schools.
10. In grades four to six teachers in low schools gave more reinforcement. In general, however, teachers in high schools gave positive reinforcement more than negative.
11. On selected items related to open education high schools appeared more open than low schools.
12. On several of the measures, differences between high and low schools seemed more pronounced in grades one to three than in grades four to six.
13. Of three devices tested, two devices significantly differentiated high and low schools arranged on a rank order basis. Thus, not only were means different, but total schools were also different.
14. In general, reasonably close relationships were found between the ratings of different observers.

15. Principals in high schools generally saw their personnel as more competent than did principals in low schools.
16. Principals in high schools saw themselves as having better rapport with teachers, parents and pupils than did principals in low schools. Principals in low schools reported better rapport with the school board.
17. Items on physical space and facilities generally did not differentiate between high and low schools.

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